

# Rhodora

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## IVY POISONING AND ITS TREATMENT.

FRANZ PFAFF, M. D. PH. D.

OF all the cutaneous eruptions caused by poisoning plants, those produced by poison ivy and by poison sumach are probably the most common in this country.

It is the general belief of the public and of most physicians, that the eczematous conditions, which occur in many persons after handling such plants may be caused also by emanations from the plant, the active principle being thought to be a volatile substance.

The two attempts to isolate the active principle failed. One of the investigators, J. Khittel, attributed the action of poison ivy to a volatile alkaloid, the other, John M. Maisch, denied it, stating that a volatile acid, which he called "toxicodendric acid" is the active principle.

Both statements proved to be erroneous, as experiments, which I made a few years ago, have shown.

The lack of any rational treatment of ivy poisoning may be ascribed to the imperfect knowledge of the cause of this disease.

In my researches (v. Journal of Exper. Med. Vol. II. No. II. 97.) I used different parts of the plants, gathered at different seasons of the year and found, that the so-called "toxicodendric acid," which Maisch did not produce in the chemically pure state, is nothing but acetic acid and therefore not the cause of the eruption peculiar to ivy poisoning.

Further investigations showed that the active principle is an oil, which I named "Toxicodendrol" and which can be found in all parts of the plants, both in *Rhus toxicodendron* and *Rhus venenata*. This oil is easily soluble in alcohol, ether, chloroform, etc., but is insoluble in water. Toxicodendrol is easily decomposed by heat, but



very slowly at ordinary temperatures. A sample of it, which had been kept in an open porcelain dish for over 13 months, was partly converted into resin, but the remaining oil proved to be just as active as before. The active oil was also prepared from plants collected during the winter after having been covered with snow for weeks and from dry stems and branches which had been kept in the laboratory for over a year.

To test the strength of the "Toxicodendrol" I made many experiments and found the oil active in the minutest quantities; in one case as little as  $\frac{1}{1000}$  mg. of the oil dissolved in 2 drops of olive oil proved effective.

The time of incubation varied from 18 hours to 9 days. This long period of incubation and the stability of the oil explain the belief, that direct contact is not necessary to contract the disease. When the first symptoms appear, several days have usually passed and a person may then not remember having come in contact with the plant. On the other hand some of the oil may stick to the clothing etc. and this may cause the disease even after several months have elapsed. In making these experiments I handled more than 25 kg. of the plants, and several hundred persons passed through the laboratory, where these experiments were made, but not one of those who did not come in direct contact with the plants or the free oil was poisoned.

It seems possible that poisoning might be caused by small particles of the plant, such as pollen and the hairs from the leaves, being carried through space by the wind and thus brought in contact with the skin or clothing, for as above stated, the oil is contained in all parts of the plant and even the hairs of the leaves may be seen under the microscope to contain oil.

Having defined the properties of "Toxicodendrol" we may now outline the rational treatment of ivy poisoning. As we have seen Toxicodendrol is not a volatile oil, but on the contrary is very stable, we must endeavor to remove it as quickly as possible and prevent its spreading.

This can be done by vigorously washing the affected and exposed parts with soap and water and a scrubbing brush; that is to say by mechanically removing the oil. As the active principle is very soluble in alcohol and gives with lead acetate a precipitate which is nearly insoluble in alcohol, other processes may be employed to remove the oil. The exposed parts may be washed repeatedly with

fresh quantities of alcohol and a scrubbing brush. The poisonous oil may be thus removed in alcoholic solution. Another way of proceeding would be to wash the exposed parts with an alcoholic solution of lead acetate; in this case the poisonous principle would be first transformed in its insoluble lead compound and then washed away with alcohol.

The washing must be done thoroughly when alcohol is employed, as otherwise the alcohol might only serve to distribute the oil more widely over the skin. The finger nails should be cut short and also perfectly cleaned with the scrubbing brush. Oily preparations, or anything which dissolves the poisonous oil, if used, should be immediately removed, as they may only spread the poison, giving it a larger area on which to work.

The treatment above outlined can not cure the already inflamed parts which must heal by the usual process of repair, but it does prevent the spreading of the inflammation and may serve to remove the poison before it has had time to produce its characteristic effects upon the skin.

HARVARD MEDICAL SCHOOL, Boston.

## NOTES ON SPOROBOLUS.<sup>1</sup>

ELMER D. MERRILL.

SPOROBOLUS DEPAUPERATUS (Torr.) Scribn. Bull. Torr. Bot. Club. 10: 63. 1883.

*Vilfa squarrosa* Trin. Agrost. 1: 78. 1840.

*Vilfa depauperata* Torr. in Hook. Fl. Bor. Am. 2: 257. t. 236. 1840.

There has been little confusion regarding this species owing to the fact that Hooker's excellent plate leaves no doubt as to the identity of the species. In the field this species is very distinct and at once recognized by its densely tufted habit, and prostrate culms which are seldom 1 dm. high, and much stouter than in *Sporobolus richardsonii*.

The type locality of *Vilfa depauperata* is "Hab. N. W. America,

<sup>1</sup> See also Nash, Bull. Torr. Bot. Club, 22: 464, 465, Bot. Gaz. 21: 155; Scribner, Bot. Gaz. 21: 14, 15.

barren sandy parts of the Columbia from Menzies' Island upward. Douglas"; that of *Vilfa squarrosa* is "America septentr. in Ins. Menzies (Hooker)." Both *Vilfa depauperata* and *V. squarrosa* were published during the same year and evidently based on the same material and as it is impossible to determine which species has the priority of publication Hooker's name has been retained, as it is the one now in use by American botanists.

The range of this species is in dry open, often alkaline soils, from Montana to New Mexico, west to California and Washington.

*Sporobolus depauperatus* (?) Scribn. Bull. Torr. Bot. Club, 9: 103. 1882, is *Muhlenbergia dumosa* Scribn.

**SPOROBOLUS richardsonii** (Trin.) n. comb.

*Vilfa richardsonis* Trin. Agrost. 1: 81. 1840.

*Muhlenbergia aspericaulis* Nees, l. c., as syn.

*Sporobolus aspericaulis* Scribn. Bot. Gaz. 21: 15. 1896.

*Sporobolus depauperatus filiformis* Beal, Grasses N. A. 2: 296. 1896.

*Sporobolus brevifolius* Nash, Bull. Torr. Bot. Club, 22: 464. 1895; Britt. & Br. Illus. Fl. 1: 153. fig. 346. 1896; Ryd. Mem. N. Y. Bot. Gard. 1: 28. 1900; Britton, Manual 105. 1901, not *Agrostis brevifolia* Nutt.

There has been much confusion regarding this form and various authors have expressed differing opinions regarding it. From a careful study of synonymy, descriptions of species and specimens, and examination of spikelets from Trinius' type of *Vilfa richardsonis* from the herbarium of the St. Petersburg Academy, I have come to the conclusion that Trinius' name is the earliest available one for this form which is a valid species, although presenting forms which intergrade with *Sporobolus depauperatus* (Torr.) Scribn. It is recognized by its scarcely tufted habit, erect slender culms which are much taller than in *Sporobolus depauperatus* and never prostrate as in that species, and which are minutely but distinctly punctate, and in its somewhat longer, more acute spikelets.

The type locality of *Vilfa richardsonis* Trin. is "Amer. boreal. (Richardson)."

The distribution of this species is in meadows, river bottoms, etc., from Anticosti Island and Maine to British Columbia, south to Nebraska, New Mexico, and California.



SPOROBOLUS BREVIFOLIUS (Nutt.) Scribn. Mem. Torr. Bot. Club, 5: 39. 1893.

*Agrostis brevifolia* Nutt. Gen. 1: 48. 1818.

*Vilfa cuspidata* Torr. in Hook. Fl. Bor. Am. 2: 238. 1840.

*Vilfa gracilis* Trin. Agrost. 1: 82. 1840, not *V. gracilis* Trin. l. c. 52.

*Sporobolus cuspidatus* Scribn. Bull. Torr. Bot. Club, 10: 63. 1883.

There has been much confusion regarding the synonymy of this species owing to the fact that there was some uncertainty as to the identity of *Agrostis brevifolia* Nutt. Through the courtesy of Mr. Stewardson Brown, curator of the Botanical Section of the Philadelphia Academy of Natural Sciences, I have been able to examine Nuttall's type of *Agrostis brevifolia* and find it to be identical with *Vilfa cuspidata* Torr., which being a later name becomes a synonym of *Sporobolus brevifolius* (Nutt.) Scribn. *Sporobolus brevifolius* Nash, Bull. Torr. Bot. Club. 22: 464. 1895, is *Sporobolus richardsonii*.

The type locality of *Agrostis brevifolia* Nutt. is "Hab. In sterile naked plains and argillaceous soils, near Fort Mandan on the Missouri"; that of *Vilfa cuspidata* is "Hab. Banks of the Saskatchewan, near the Rocky Mountains, Drummond, Plains of the Red River, Douglas"; while that of *Vilfa gracilis* Trin. is "Amer. Boreal. ? (Hooker)." There is in the U. S. National Herbarium a portion of Trinius's specimen of *Vilfa gracilis* from the herbarium of the St. Petersburg Academy, which is certainly the same as Nuttall's *Agrostis brevifolia*.

The range of this species is in dry open soils from Wisconsin, Iowa, and Nebraska, west to Nevada and Montana.

SPOROBOLUS FILIFORMIS (Thurb.) Rydb. Contr. U. S. Nat. Herb. 3: 189. 1895; Scribn. U. S. Dept. Agr. Div. Agros. Bull. 17: 173. fig. 469. 1899.

*Vilfa depauperata filiformis* Thurb. in U. S. Geol. Explor. 40th Par. 5: 376. 1871.

*Vilfa gracillima* Thurb. in S. Wats. Bot. Calif. 2: 268. 1880.

*Sporobolus gracillimus* Vasey, Descr. Cat. 44. 1885.

This species is fairly distinct, presenting intergrading forms with *Sporobolus simplex* Scribn., in general, however, being distinguished by its more slender, taller culms and mostly awnless spikelets. Its

range is on sandy shores, light, moist or rather dry soils, etc., from Nebraska and South Dakota to California and Washington.

**SPOROBOLUS SIMPLEX thermale** var. nov. A rather robust annual 2.5 to 3 dm. high, with numerous, short plane leaves about 2 mm. wide, and purplish, exserted, rather densely flowered, almost spikelike panicles 2.5 to 4 cm. long, 3 to 4 mm. in diameter. Spikelets 2 mm. long, the flowering glume scabrous, acute, mostly awnless.

Type specimen collected on the margin of a stream of hot water, Lolo Hot Springs, Montana, 302a David Griffiths, Sept. 17, 1898. No. 302 Griffiths, same locality and date, is also referred here.

This variety could with equal propriety be referred to *Sporobolus filiformis* (Thurb.) Rydb., but is distinguished from both *Sporobolus filiformis* and *S. simplex* by its more robust habit, and densely flowered panicles. In its awnless flowering glumes it approaches nearer the former although in general aspect it resembles *Sporobolus simplex*, but lacks the awned flowering glumes of that species.

**SPOROBOLUS ARISTATUS** Rydb. Bull. Torr. Bot. Club. 28: 266. 1901.

In his description of this species Dr. Rydberg cites three specimens, 2196 and 27 Tweedy from Wyoming, and 1281 S. Watson from Utah. We have had access to the two latter numbers and after a most minute examination of those specimens we have been unable to distinguish this species from *Sporobolus simplex* Scribn. and must consider it only a depauperate form of that species. The presence of an awn to the flowering glume is an exceedingly variable character, and even in the type of *Vilfa depauperata filiformis* Thurb. (*Sporobolus filiformis* Rydb.) awned and unawned spikelets are found on the same plant.

**SPOROBOLUS gracilis** (Trin.) n. comb.

*Vilfa gracilis* Trin. Agrost. 1: 52. 1840; not Trin. l. c., 82.

*Vilfa subsetacea* Trin. l. c., Arabic 111.

*Agrostis juncea* Michx. Fl. Bor. Am. 1: 52. 1803, not Lam. Encycl. 1: 60. 1783.

*Heleochloa juncea* Beauv. Agrost. 24. 1812.

*Colpodium junceum* Trin. in Spreng. Neue. Entd. 2: 37. 1821.

*Sporobolus junceus* Kunth, Rev. Gram. 1: 68. 1835.

*Sporobolus ejuncidus* Nash in Britt. Manual 106. 1901.

There are in the U. S. National Herbarium spikelets from Trinius's type of *Vilfa gracilis* from the St. Petersburg Academy, the type locality of which is "Carolina." It is very evident from examination of these



spikelets and Trinius's description that his *Vilfa gracilis* is identical with *Agrostis juncea* of Michaux, although on the following page of the same work Trinius considers *Vilfa juncea* (Michx.) as a distinct species, evidently, however, basing his description mainly on South American material which was probably not the true *Agrostis juncea* of Michaux. Through an error Trinius published a second species of *Vilfa* under the specific name *gracilis* in the same work, page 82, which, however, is a synonym of *Sporobolus brevifolius* (Nutt.) Scribn. In indexing this volume Trinius discovered his error and applied a new name *Vilfa subsetacea*, page 111, to his first *Vilfa gracilis* rather than to the second and hence *Vilfa subsetacea* becomes a synonym of *Sporobolus gracilis*. In Britton's Manual Mr. Nash applied the name *Sporobolus ejuncidus* to this species, owing to the fact that the name *Sporobolus junceus* was untenable because Michaux's original publication of the species sub *Agrostis*, was antedated by *Agrostis juncea* Lam. According to the above note this name becomes a synonym, as the species already had two available names, *Vilfa gracilis* and *Vilfa subsetacea*.

WASHINGTON, D. C.

## MISCELLANEOUS NOTES ON NEW ENGLAND FERNS, — IV.

GEORGE E. DAVENPORT.

NOTE 7. THE EVERGREEN FERNS OF NEW ENGLAND.— A winter study. This note is intended as a guide to the study of those ferns which remain green, or nearly so, through the winter and early spring, when the frequently occurring intervals of mild weather afford numerous opportunities for studying them to advantage.

With the disappearance of the late autumn foliage from the hills and woodlands, the rocky ledges stand out in bolder relief, exposing to view the great masses of polypody that fringe the boulders with their dark green fronds; the marginal shield ferns that crouch low at their bases for shelter, and the tiny spleenworts that have been hiding away securely in the crevices of the cliffs through all the summer season. In the woodland swamps, when free from snow, the

prostrate forms of the large ferns are exposed to view, and then is a good time to study the crowns and crosiers.

Then too is a good time to search for abnormal forms of the polypody, which in England produces so many remarkable variations. Among the countless thousands of plants distributed throughout our New England woodlands one may well expect to find many interesting forms, which, while they might not be of any great importance from a taxonomic standpoint, would yet be of some interest biologically, and help to increase our knowledge of the causes for plant variation.

It may be objected to the treatment adopted in this study, that, being based largely on the character of the rootstock, it may lead to the extermination of rare ferns by the taking up of plants; but this need not necessarily follow. The rootstocks of nearly all of our ferns can be studied without disturbing them enough to retard their growth, and with proper precautionary instructions it will be found that those who realize the importance of protecting and preserving our native plants will be less liable to destroy them through this method than they would be through any other. Thus this method may even become a valuable medium for aiding in the preservation of rare plants.

Roughly grouping our New England Ferns by their most obvious characters for the convenience of a ready recognition we may separate them into two sections as follows:—

I. EVERGREEN, or partially so, at least as to the late sterile fronds. Fronds more or less persistent through the winter.

II. NOT EVERGREEN. Fronds withering away on the approach of winter.

These sections may each be subdivided into three divisions based on the nature of the rootstock in accordance with the following arrangement.

DIVISION A.—ROOTSTOCK RHIZOMATOSE, *i. e.*, having the character of a rhizome—a running stem. Fronds more or less scattered; crosiers (frond-buds) usually isolated.

DIVISION B.—ROOTSTOCK CAUDICIFORM, *i. e.*, short, stout, and having the form of a caudex. Fronds fasciculate, *i. e.*, clustered at the growing end. Here occur two forms namely: with the rootstock, in the one case, *erect*, or partially so, growth upright; and in the other, *decumbent*, growth lateral, extending horizontally.

DIVISION C.—ROOTSTOCKS CAESPITOSE, *i. e.*, forming tufts or little bunches.

As this guide is intended especially for winter and early spring use, only the first section (with more or less evergreen fronds) will be considered here.

Under Division A (with rootstock rhizomatose) we have the following ferns:—

\* Fronds climbing; rhizome long and slender; stipes and flexuose rachises twining on shrubbery in rather open woodlands.

1. *LYGODIUM PALMATUM*, Swartz. Climbing Fern. Sterile portion persistent, fertile portion perishing; pinnae palmately divided, or lobed. N. H., Mass., Ct.

\*\* Fronds not climbing, green all winter, stipes articulated to a moderately stout scaly rhizome.

2. *POLYPODIUM VULGARE*, Linnaeus. Common Polypody. Abundant on boulders, ledges and rocky hillsides. Me., N. H., Vt., Mass., R. I., Ct.

Obs.—Var. *cambricum* has been found in Connecticut (*Dr. Underwood*) and New Hampshire (*Mrs. F. G. Webster*), and some very interesting abnormal forms have been collected in Vermont by Miss Slosson.

Under division B (Rootstocks caudiciform). Plants large.

\* Rootstock erect, or partially so, growth upright.

3. *NEPHRODIUM MARGINALE*, Richard (*Aspidium*, Swartz).—Marginal Shield-fern. Fronds once or twice pinnate, margins entire or crenate; sori marginal. Rocky hillsides with no. 2, ravines and swampy woodlands with 4, 5 and 6. Me., N. H., Vt., Mass., R. I., Ct.

One or two forms have been designated but appear to me little more than states of development.

4. *NEPHRODIUM CRISTATUM* × *MARGINALE*, Davenport. Fronds resembling no. 3 in the upper portion, and no. 5 in the lower; lobes toothed more as in no. 5. Sori sub-marginal or medial. Found always with no. 3 and no. 5 between which it is a natural hybrid, as Miss Slosson has successfully demonstrated by raising it by artificial crossing from spores. Me., Vt., Mass., R. I., Ct.



Obs.— Under favorable conditions fertile fronds of nos. 3 and 4 remain green nearly all winter. It may be well to add, however, that, as is the case with nearly all of these ferns, both fertile and sterile fronds, when surviving, become flaccid in autumn and lie prostrate through the winter, becoming more or less discolored.

\*\* Rootstock decumbent, growth lateral, extending horizontally.

5. *NEPHRODIUM CRISTATUM*, Richard (*Aspidium*, Swartz). Late sterile fronds remaining green all winter, fertile fronds withering gradually, long lanceolate with nearly triangular deeply pinnatifid pinnae, normally acute, or obtuse at the apex, but in var. *Clintonianum* long acuminate; lobes in both forms bluntly toothed; sori medial, or nearly so. Low swampy woodlands. Me., N. H., Vt., Mass., R. I., Ct.

Obs.— In var. *Clintonianum* the rootstock is much stouter, and the crowns are more loosely built up as it were, the crosiers overlapping one another irregularly much after the manner of the knuckles on a half closed hand. The large ovate and lanceolate scales with which the crosiers are clothed shade from light amber to dark brown in both forms, and on old fronds the rounded backs of the stipes shade to blackish brown.

An interesting form with apparently strictly herbaceous fertile fronds that perish altogether in early autumn has been collected in Vermont by Miss Margaret Slosson for several years, and may prove to be distinct; however as some sterile fronds on two or three plants of it that have been growing on my own grounds are still green at present writing (Feb. 5th), I am not ready to accord to it specific rank; I have, however, provisionally named it *Nephrodium cristatum*, Rich., var. *Slossonae*, n. var. Fully matured plants of this form are quite as large as, if not larger, and with broader fronds than var. *Clintonianum*; the texture is thinly herbaceous and the sori are arranged in a close costal series much as in *Nephrodium Goldieanum*, from which, however, it is wholly distinct. I shall have more to say about it at another time.

A conspicuous feature in all of the *cristatum* forms in winter is seen in the deeply sunken blackish grooves in the upper coriaceous surfaces, and the elevated lines beneath which mark the course of the venation.

6. *NEPHRODIUM BOOTII*, Davenport in Gilbert, Catl. 1901 (*Aspidium*, Tuckerman). Fertile fronds on my grounds at present

writing (Feb. 5th) brown and withered, but stipes partially standing; sterile fronds prostrate and green. Normal fronds broadest above the middle, resembling no. 5 below, and no. 7 $\beta$  above, the lobes more deeply toothed than in no. 5, and less sharply so than in no. 7 $\beta$ . Indusium when found finely glandular. Swamps with nos. 5 and 7, Me., N. H., Vt., Mass., R. I., Ct.

7. *NEPHRODIUM SPINULOSUM* Desvaux (*Aspidium* Swz.). Fronds with the divisions all *spinulosely* toothed, and more deeply cut than in other members of the group. Widely distributed in various situations, Me., N. H., Vt., Mass., R. I., Ct.

Many forms of this protean species have been found, but the following are all that appear worthy of permanent recognition.

*a.* Normal form.—Whole frond smooth, pinnae obliquely set to the main rachis, the lowermost pair shortest; sori terminal on the veinlets which terminate *within the radius of the fruit-dot (sorus)*; indusia smooth; scales of the crosiers light brown.

$\beta$ . Var. *intermedium*, Davenport. Divisions of the lamina more finely cut, pinnae spreading at right angles; *under surfaces and indusia finely glandular* especially along the darker rachises and mid-nerves; sori below the apex of the veinlet which extends beyond the radius of the fruit-dot; scales of the crosiers darker.

$\gamma$ . Var. *dilatatum*, Baker. Nearly as in *a*, but much larger every way, the mountain forms being broadly triangular ovate; *sori* below the apex; scales on the crosiers dark with blackish centres on some of the largest forms.

Obs.—As is well known *Nephrodium dilatatum* is considered by English authors generally as being a wholly distinct species from *N. spinulosum*, and even Moore, who yet regarded *spinulosum* as a mere variety of *cristatum*, so treated it under *Lastrea*, describing several forms as varieties. His description of *var. tanacetifolia* “fronds ample, triangular or sub-triangular ovate, tri-quadri-pinnate; scales of the stipe dark-centred” (Native Printed Ferns 1, 225) exactly fits our mountain forms from New Hampshire and Vermont; but Moore’s forms are all described as having *glandular indusia*, whereas in our form the indusium is smooth as in *a*.

8. *POLYSTICHUM ACROSTICHOIDES*, Schott (*Aspidium*, Swartz). Christmas Fern. Whole plant remaining green, or nearly so; fertile fronds contracted above the middle, the tips only perishing; pinnae auricled at the base, *spiny toothed*. Rocky hillsides and ravines, Me., N. H., Vt., Mass., R. I., Ct.

Obs.—As pointed out in my previous note (RHODORA, iv. 9) POLYSTICHUM is especially characterized by its densely opaque, or coriaceous texture, auricled pinnae and *aculeate* or *spiny* toothed lobes.

9. POLYSTICHUM ACULEATUM Swartz, var. BRAUNII Davenport (RHODORA, l. c.). Stipes and rachises thickly clothed with soft hairs and chaffy scales; crosiers densely covered with rich brown scales and chaff; margins of lobes aculeate. Mountain ravines, Me., N. H., Vt.

Under Division C (Rootstock caespitose). Plants small.

10. PELLAËA ATROPURPUREA, Link. Purple Cliff-Brake. Not strictly caespitose, but rhizomes short, moderately stout, and with the stipes so closely approximated as to appear tufted. Doubtfully evergreen with us unless in especially favorable situations. Miss Slosson writes me that she has found that it drops its pinnae in winter, "the stipes and rachises remaining." Needs further investigation and the winter season is a good time for it. Limestone cliffs, N. H., Vt., Mass., R. I., Ct.

11. ASPLENIUM TRICHOMANES, Linnaeus. False Maiden-hair. Fronds all alike, narrowly linear, pinnate; stipes and rachises black, or purplish black, and shining. Rock crevices, Me., N. H., Vt., Mass., R. I., Ct.

12. ASPLENIUM VIRIDE, Hudson. Green Spleenwort. Resembling no. 11, and in similar situations, but with stipes and rachises green. Vt.

13. ASPLENIUM EBENEUM, Ait. Ebony Spleenwort. Sterile fronds in rosette-like clusters at the base of the taller erect fertile fronds; stipes and rachises purplish black and shining, or in *var. Hortonae*—a sterile form with plumose fronds—reddish. With no. 11, Me., N. H., Vt., Mass., R. I., Ct.

14. ASPLENIUM EBENOIDES, R. R. Scott. Fronds more or less distorted, and sometimes proliferous. A natural hybrid between nos. 13 and 17 with which it has always been found growing and to be looked for wherever those two ferns are plentiful in close proximity to one another. Vt. (*Eggleston, Woolson & Swift*), Ct. (*Adam*).

15. ASPLENIUM MONTANUM, Willdenow. Mountain Spleenwort. Fronds ovate-lanceolate and much incised. A comparatively recent addition to our New England fern-flora, and as yet little known. Limestone cliffs, Ct.



16. *ASPLENIUM RUTA-MURARIA*, Linnaeus. Fronds deltoid, with wedge-shaped divisions, Limestone cliffs, N. H., Vt., Mass., Ct.

17. *CAMPTOSORUS RHIZOPHYLLUS*, Link. Walking Leaf. Fronds undivided, with prolonged proliferous tips; abnormal forms not infrequent. Limestone cliffs, but also on other formations. Me., N. H., Vt., Mass., R. I., Ct.

This completes the evergreen true ferns of New England, but in old meadow lands, about hummocks and shrubbery, on springy hill-sides, or in low woodlands, when free from snow, in many places may be found the ternate fleshy sterile forms of *Botrychium ternatum*. So also may be found the handsome furrowed stems of the scouring rush (*Equisetum hyemale* L.) and several forms of club moss (*Lycopodium*), and *Selaginella*.

NOTE. In the preparation of this matter I have been greatly indebted to Miss Slosson for many valuable observations which it gives me pleasure to acknowledge here.

MEDFORD, MASSACHUSETTS.

## OUR CHOKEBERRIES.

W. H. BLANCHARD.

THE compilers of the Flora of Vermont could find no authenticated specimens of the Red Chokeberry, *Pyrus arbutifolia*, L., and so left it out, though the Black Chokeberry was given as common. On May 26, 1900, I found the Red Chokeberry on Rocky Hill in Westminster, Vermont, about two miles from the Connecticut River. While I felt sure I had found the typical plant and no variety or "form," I sent it to Pres. Brainerd and Mr. Fernald to have it compared with authenticated specimens. Both pronounced it a normal plant of the type form. So Vermont botanists can add another plant to our growing list.

Some of my observations on both of our Chokeberries are here given. They seem to indicate that these plants are variable in several respects and may interest botanists. The plants have an abundance of Latin names, some of them indicating that the color of the fruit has been considered to be practically uniform.

The Illustrated Flora describes the Red Chokeberry as from five

to twelve feet high; lower surfaces of the leaves, calyx and pedicels tomentose; fruit globose or depressed, bright red, two or three lines in diameter; growing in swamps and wet woods. Gray gives it as common from Nova Scotia to Florida. It grows at my Westminster station on dry, rocky knolls scattered over a large area of poor, broken woodland, but not in the swampy or moist places. The fruit was not fairly ripe and red till the middle of September, and later it turned black. It was much smaller than that of the Black Chokeberry, which grew here also, and six weeks later. It will be noticed that in Vermont it is not common and does not in this case grow in swamps and wet places.

I have watched it at a station in Walpole, New Hampshire, also. Here it grew in a moist place, but the fruit had only a mere tinge of red and that on only a small part of the berries. At both these stations the fruit was globose-depressed like an apple. But on September 21, 1901, I found a Walpole station on Drewsville Plain so often mentioned in Mr. Fernald's article in RHODORA, iii. 232. It was near "Aunt Philae's" pond, and the plants were from six to ten feet high, but the fruit was as large as that of the Black Chokeberry, elongated-globose like it and as black, plump and shining. I sent specimens to Mr. Fernald and he thought we must call them *P. arbutifolia*. At all three stations the woolly condition of the underside of the leaves, of the calyx and the pedicels was the same and continued throughout the season.

The Black Chokeberry is described in the Illustrated Flora as having the underside of the leaves, pedicels and calyx glabrous; fruit globose or oval, nearly black or purplish black, three or four lines in diameter; growing in swamps and low woods or sometimes in drier situations. Gray gives it as having black fruit, and Wood as growing in swamps, and from two to five feet high. I have seldom seen it in a swamp or wet place. It is often five or six feet high though generally it is shorter. It often grows with Huckleberries and is generally supposed or said to be poisonous. Some of its common names are expressive if not polite. I have not found it astringent as the floras give it, but flat and tasteless.

I found it very abundant in Stratton, Vt., on the historic ground where Daniel Webster addressed the famous gathering of the Whigs of Southern Vermont in 1840. Many specimens were bright-red but otherwise normal, and none grew in damp places.

On the coast of Maine, especially on the plains of Kennebunkport where boreal plants are so common, I found large areas of it mostly about a foot high. On August 8, 1901, I saw near the Town House large patches which had red and purple fruit. In a few days this had darkened a great deal and was wrinkled and dull, while the normal fruit was plump and shining. In all cases the leaves and pedicels were glabrous.

It is evident that these plants need much further study and I should be pleased to hear from others in regard to them.

WESTMINSTER, VERMONT.

## NOTES ON LYCOPODIUM.

R. G. LEAVITT.

LYCOPODIUM CLAVATUM, VAR. MONOSTACHYON ON MT. MONADNOCK. — In driving through elevated pasture land on the outlying southern slopes of Mt. Monadnock, New Hampshire, in November, 1901, I was attracted by a growth of *Lycopodium clavatum* covering a plot of dry open ground 12 or 15 feet in diameter, and noticeable even at some little distance for its unusual appearance. The plant differed from ordinary *clavatum* in having an exceedingly stiff habit, the secondary shoots being shorter and more erect, the lateral segments of these shoots less divergent, and the leaves far less spreading than in the type. The later leaves of each season were closely appressed, the latest particularly so, and thus the annual growths of the branchlets being plainly marked off the plant had a conspicuously articulated appearance. I found in all 70 peduncles bearing in each case a single strobile.

Analogous forms of *L. complanatum* and *L. obscurum* are to be seen where these species occur in open, dry situations. In *complanatum* we get short, sparingly branched, more or less erect segments, and reduction in the number of strobiles to each peduncle; in the *obscurum*, similar effects on the general habit, with certain resultant changes in the plan of the lateral segments. These variations, which are often very pronounced, are due to physiological causes. On the contrary the characters distinguishing the form of *L. clavatum* in question seem to be constitutional. The specimens taken agree with plants from further north, of the variety *monostachyon*. This



variety was the subject of a note in RHODORA for September, 1901. Dr. B. L. Robinson, the writer, found var. *monostachyon* abundant along with the type in northern Aroostook County, Maine, and at Grand Falls, New Brunswick, and states that in some places it becomes the prevailing form. Its range is indicated by the localities and regions cited, — Prince Edward's Island, Katahdin, Alstead, N. H., Lake Winnipeg, and the Rocky Mountains of British North America.

THE GEMMAE OF *L. LUCIDULUM*. On a sloping rock partly covered with leaf mold I found 25 young plants of *L. lucidulum*, of various ages, derived from gemmae. I was interested in noting that some of these plantlets were 3 feet from the nearest adult growth of the species, and at a level one foot higher. How did the gemmae reach this distance and elevation? They are said by various writers to "fall" or to be "spontaneously loosened" from the parent stems. Some time later when I found *L. lucidulum* with the propagative buds undisturbed, I was able partly to answer the question. Pressing down gently at the extreme edge of the cotyledon-like leaf of one of the buds I broke the gemma off. It did not fall but snapped, and landed 11 inches away. The second flew 25 inches, the third an equal distance. It seems then, that elastic recoil from some source may throw the ripe gemmae a little distance when these bodies are struck, as by rabbits or birds or perhaps by rain drops. The shape of the bud, which is slightly concave above and is held out as it were like the hollowed hand, palm upwards, lends some degree of plausibility to the idea that drops of rain or the heavier drip from trees may be the usual means of loosening the gemmae. The range of the trajectory may be 3 or 4 feet, at the greatest. This, I take it, is about 40 times the annual advance by growth. The time taken for bud-derived plants to mature, before another saltus of this kind can occur, must very greatly reduce the relative gain in dissemination as effected solely by snapping of the gemmae; perhaps the ratio of gain may be 3 or 4.

Archangeli says that the gemma, or "bulbil," of *L. Selago* — very similar to that of *L. lucidulum* — falls off, and that, without any disarticulation by cellular disintegration, the tissues of the short pedicel bearing the bulbil are ruptured through the pressure of cushion-like swellings arising on the bases of the fleshy side leaves of the bulbil and jutting against the upper leaves of the pedicel. When the stress due to the growth of the swellings is greatest, a downward blow may convert the pressure into an efficient propulsive force.

LYCOPODIUM COMPLANATUM, VAR. FLABELLIFORME.—The main stem of *L. complanatum* is spoken of by Gray's Manual as "extensively creeping (often subterranean)." The *L. complanatum* of the Manual is the variety *flabelliforme*, Fernald. By my observation the main stem is very much oftener unbranched—the vertical secondaries aside—than branched. On the average of many plants examined, it divides less than once in five or six years. And I have never found it subterranean. It creeps onward in a single line, as a rule reaching forward annually a foot more or less, and always running over the surface unless by accident the tip meets an obstruction. If the way is barred the tip may make a detour and become for a short distance in a manner subterranean. Otherwise it lies upon the surface. The duration of the stem is five or six years; that is, the oldest part, which is about to be overtaken by decay, is five or six years old. Naturally in the course of so many years the stem often becomes covered with leaf mold. It does not, however, seek a subterranean path, so far as I have been able to find.

These points with regard to var. *flabelliforme* are of some value in determining the standing of the variety (?), or species (?), *chamaecyparissus*.

The number of strobiles to the peduncle I find very variable, according to local conditions. Strong light and dry soil tend to restrict the branching of the fruiting axes, and this effect is often marked. For example a plant collected without particular attention to the number of spikes proves to have the following strobilation.

Strobiles per peduncle	1	2	3	4
Cases found	3	9	2	0

The average number of strobiles is 1.9—

At Jaffrey, New Hampshire, I gathered a good number of spikes from a variety of situations in order to obtain some idea of the tendency of the plant in that region in the matter of branching of the inflorescence (if we may so speak or the "fruiting" parts). The count shows such a degree of variation that one may probably conclude that the influence of soil, light, etc., is greater than that of geographical position. At least it indicates that it would be a very arduous task to make even an approximate determination of the general tendency in any district. Spikes gathered in an open fallow field, in moderately dry soil, where there was no shade, gave the following figures:

Strobiles per peduncle	1	2	3	4	5	6
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Cases found	1	67	249	195	1	0
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Prevalent number 3, average 3.25.

In low, rich woods the following results were obtained:

Strobiles per peduncle	1	2	3	4	5	6
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Cases found	0	10	74	457	32	2
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The fours predominate strongly; the average number is 3.9.

THE AMES BOTANICAL LABORATORY, North Easton, Massachusetts.

PLANTS NEW TO EASTERN MASSACHUSETTS.—On June 14, 1901, I found in a rocky path on the south side of one of the Blue Hills in Milton, several specimens of *Carex glaucoidea*, Tuckerm. This plant has not before been reported east of Mt. Holyoke, Massachusetts, in the Connecticut Valley, when Tuckerman discovered it in June, 1865, in a similar rocky path on the south side of the mountain; from this point it has been found west and south to Illinois and Arkansas. July 9 I noticed near the roadside in Milton a new *Hieracium*, *H. vulgatum*, Fries. The plants were in abundance behind an old wall on land that had not been cultivated for twenty years or more and included specimens of very varying size from three to thirty-two inches high.

On Aug. 15, at Scituate, I saw a singular looking brown *Juncus* resembling *J. nodosus*, L., which I took to be *J. scirpoides*, Lam., but on examination it proved to be *J. brachycarpus*, Engelm. This quite southern species is reported in the February RHODORA as found near New London, Connecticut, the past season by Dr. Graves, both stations new to New England. At Scituate it grew on a gravelly ridge about a third of a mile from the ocean, and in a patch of peculiar reddish soil quite different from the general soil of the ridge. The gravel was in small equal sized particles with a peculiar greasy feeling to the hand; and neither the plant nor the soil were observed elsewhere.

As an explanation of one possible distribution of plants I have never seen any notice taken of the transportation of soil from any distant place to another locality; but some years ago while walking in Wareham, Massachusetts, I noticed a bit of fossil rock in the highway much like the stones on the Potomac shore near Mt. Vernon,



and certainly not like anything on Cape Cod. In answer to my inquiries I was informed that a few years before a Wareham schooner had brought back from Chesapeake Bay a ballast load of gravel which had been used on the sandy road at this part to make a better highway. Almost all gravel transportation is by railroad and for comparatively short distances, but when brought in schooner loads from a southern shore we may certainly expect new plants and animals to be concealed in it.—G. G. KENNEDY, Readville, Massachusetts.

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SOME PLANTS OF INTERVALE, NEW HAMPSHIRE.—It may interest the readers of RHODORA to know that in August of the years 1889 and 1890 *Pogonia pendula* was found at Intervale, New Hampshire. It grew not very plentifully in two or three very limited areas under beech trees, often pushing up through the beech leaves and carrying them like an unwieldy collar at a little distance below the flowers. Since the years mentioned I have not been in Intervale during the month of August and have no means of knowing whether this orchid still grows there.

Along a railway cutting through a sand bank at Intervale, there is always to be found a quantity of *Polygonella articulata*,—a station unusually far inland and also marking perhaps the northern limit of this species in New England.

*Hudsonia tomentosa* grows plentifully among sand and pebbles in abandoned beds of the Saco along the road to Echo Lake, or in bottoms subject to overflow, and has increased noticeably in the last ten years. From the Gray Herbarium I learn that this is the *Hudsonia* secured at Intervale some years ago by Miss Susan Minns. Her plant was correctly determined as *H. tomentosa* by the late Dr. Sereno Watson and is so labeled in the Gray Herbarium, but by some clerical error it was recorded in the 6th edition of Gray's Manual as *H. ericoides* and this mistake was repeated in the Synoptical Flora.

I have also found *Paronychia argyrocoma* on sand bars of the Saco near Humphrey's Ledge at Intervale.—FRANCES C. PRINCE, Boston, Massachusetts.

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THE "KING-DEVIL WEED" IN THE PENOBSCOT VALLEY. — I am not aware that *Hieracium praealtum* has been recorded from this part of Maine, and if not the following record may be of interest. On June

15, 1901, I found it growing commonly and in full blossom between Kenduskeag and Corinth. It was in fields and meadows and by the roadside. The plant must have been established in this locality for a number of years in order to have become so abundant. The common Orange Hawk-weed, *Hieracium aurantiacum*, was growing associated with the preceding and equally abundant. — O. W. KNIGHT, Bangor, Maine.

[*H. praealtum*, characterized as the worst weed which has recently appeared in Maine, has destroyed many hayfields in the Kennebec Valley, where Mr. H. K. Morrell and others have made vigorous though usually vain attempts to arouse the farmers to their obligation to check its rapid encroachment. Its spread in the Penobscot Valley, where *H. aurantiacum*, the Orange Hawk-weed or "Devil's Paint-brush," is already a pest, should be scrupulously guarded against.— Ed.]

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CYPRIPEDIUM ARIETINUM ON MT. TOBY, MASSACHUSETTS. — In the list of New England plants published by Mr. E. T. Williams in the January number of RHODORA, *Cypripedium arietinum*, R. Br. has been omitted from the Massachusetts column, but it still grows on Mt. Toby where it was first reported by Clark as recorded in Tuckerman's Amherst Flora. I found the plant growing there in 1874; and apparently its numbers have not decreased from that day to this.

So far as I know, the only species that should now be stricken from Tuckerman's Amherst list is *Lysimachia punctata*, L. It grew in South Amherst near a roadside fence that has since been removed and the ground plowed up. Perhaps it now grows elsewhere in the Amherst region, but it is no longer found in the locality where it was first reported. — L. H. ELWELL, Amherst, Massachusetts.

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LIPARIS LOESELII IN MASSACHUSETTS. — After the January issue of RHODORA had been mailed it was found that the plate of page 19 had been damaged during the press-work and that in all the later copies the plus sign, indicating in the tabular matter the occurrence of *Liparis Loeselii* in Massachusetts, was completely obliterated. The species is, of course, well known in Massachusetts, and was duly recorded for the state by Mr. Williams in his very full and critical list of our New England orchids.

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THE JOSSELYN BOTANICAL SOCIETY OF MAINE, — MID-WINTER MEETING. — The meeting of the Josselyn Botanical Society of Maine, held at the rooms of the Portland Society of Natural History,

December 28, 1901, was attended by many members and friends from different towns in the state. In the absence of the President, A. L. Lane, the meeting was called to order by Dr. Dana W. Fellows, chairman of the committee of arrangements, and Prof. Leslie A. Lee of Bowdoin College was made Chairman of the meeting.

During the afternoon four announced papers and many brief informal reports at roll-call were presented. Mr. Edward B. Chamberlain, of Vassalboro described in detail a large peat bog in Cumberland, discussing the ecological and physiological relations of the plants of the different belts of vegetation from the pond at the centre to the wooded margin of the bog. Miss Kate Furbish of Brunswick summarized much of the present knowledge of useful native plants of the State, and furthermore enumerated many species which are justly winning recognition as ornamental plants. Mr. Merritt L. Fernald of Cambridge, Massachusetts, exhibited about fifty of the recently discovered plants of Maine, calling attention to the specific peculiarities of the plants, and emphasizing the relation of these discoveries to our general understanding of laws of plant geography. Rev. B. P. Snow of Yarmouth discussed the functions and work of foliage.

After the announced papers there was a roll-call of members at which each responded by a brief note or by some suggestion or question. These responses contained much of interest to the members, that of Dr. D. W. Fellows being specially interesting to readers of RHODORA. Dr. Fellows has corresponded with Mr. Hall, formerly of Shapleigh, Maine, in regard to the occurrence of *Camptosorus rhizophyllus* in York County; and it is now established that the specimen of *Camptosorus* at the University of Maine, supposed to have been found at Shapleigh, grew in western Massachusetts. It is probable, also, that *Anemonella thalictroides*, reported on the authority of the same collection from Shapleigh, was not originally gathered in Maine.

In the evening Mr. Austin Carey, Forester for the Berlin Lumber Company, and formerly of the Maine Forestry Commission, gave an instructive and encouraging lecture on forestry, with especial reference to the conditions in Maine, though illustrated also by comparative scenes in the forests of the Pacific Slope, the Great Lake Region and the Black Forest of Germany.—DORA H. MOULTON, Secretary, Portland, Maine.



THE SEVENTH ANNUAL WINTER MEETING OF THE VERMONT BOTANICAL CLUB held at the University of Vermont, Burlington, on the 24th and 25th of January, was the most successful of any in the history of the Club. More than fifty botanists were present, and fifteen names were added to the membership. The program included twenty-three papers, representing a wide range of taxonomic, morphological, physiological, and economic subjects. Among cryptogams thirteen species of mosses and seven of algae new to the State were listed. Mrs. Frances B. Horton reported finding *Dryopteris simulata* Dav. at Brattleboro', the first record for Vermont, and *Lygodium palmatum* Swartz only twelve miles distant in New Hampshire. A large number of flowering plants has been added to the local flora of Burlington, and sixty-four species new to the state have been reported since the publication of the Flora a little over a year ago. The problems of forestry aroused much interest, and the need of enlightenment in this field for the purpose of awakening general action and influencing legislation was emphasized. Nature study and the botanical work of secondary schools received attention in several papers. President Brainerd suggested as the chief problems for the next season the careful study of such critical groups as *Viola*, *Rubus* and *Crataegus*. The address by Professor B. L. Robinson on Some Recent Advances in the Classification of the Flowering Plants, in which an outline of the history of taxonomic systems was followed by a most lucid exposition of the Eichlerian principles as developed by Engler and Prantl, was listened to with great interest by a number of persons outside the ranks of working botanists as well as by the members of the Club. The officers were re-elected as follows: President Ezra Brainerd of Middlebury College, president; Mr. C. G. Pringle, vice-president; Professor L. R. Jones, secretary. The field meeting next summer will take the form of an excursion to the islands and shores of Lake Champlain. — T. E. HAZEN.

*Vol. 4, No. 38, including pages 23 to 42 was issued 10 February, 1902.*

## BANGOR AND AROOSTOOK RAILROAD.

get **CAREX PORTERI**, *C. saxatilis*, var. *miliaris*, and *C. Grahami* from the gravelly shores or low woods; and on Kineo he will look for *Draba incana*, var. *arabisans*, *Primula farinosa*, *Shepherdia canadensis*, *Carex capillaris*, and *Aspidium fragrans*.

In the Katahdin Iron Works region, too, the botanist will be very happy, but the great botanizing begins as he approaches southern Aroostook County. From the main line of the railroad beyond the Katahdin Iron Works district one has some splendid views of Mt. Katahdin itself with the neighboring masses of Sordnahunk and Traveller Mts. If one does not make up his mind at once to explore the giant amphitheatres and castellated ridges of Katahdin, he is no true lover of the best of botanical exploring and of inspiring mountain life. (For detailed account of Katahdin and its flora, as far as known, see RHODORA for June, 1901.)

At Crystal flag-station one should stop long enough to explore a bit of the great bog which furnishes the upper waters of Molunkus Stream. Following the railroad back half a mile he will find himself surrounded by masses of *Betula pumila*, *Lonicera oblongifolia*, and other northern shrubs, with an herbaceous flora including *Parnassia caroliniana*, **DRO-SERA LINEARIS**, *Valeriana sylvatica*, *Aster junceus*, *Pyrola rotundifolia*, var. *uliginosa*, *Tofieldia glutinosa*, *Carex chordorhiza* and *C. livida*.

If he wishes to stop for some time in the region (and who does not) he can have good accommodations at Island Falls; and there, near the Mattawamkeag River, he will get the local **ANTENNARIA RUPICOLA**, *Hieracium vulgatum*, *Erigeron acris*, and *Halenia deflexa*. In the river, itself, and in Mattawamkeag Lake he will revel in September, dragging up such prizes as *Myriophyllum Farwellii*, *M. alterniflorum*, and *Potamogeton obtusifolius*.

When Houlton is reached one should make up his mind to stop at some of the numerous villages between there and the Aroostook River, for the Cedar (*Arbor-vitae*) swamps of the Meduxnakeag and the Presque Isle valleys are the homes of *Cypripedium spectabile*, *Microstylis monophylla*, *Carex vaginata*, and scores of other species of absorbing interest.

The valleys of the Aroostook and the main St. John—for instance at Fort Fairfield, Van Buren, Fort Kent, and St. Francis—furnish one of the most striking floras of New England. There among other species one will get **THALICTRUM CONFINE** and **T. OCCIDENTALE**, **OXY-TROPIS CAMPESTRIS**, var. **JOHANNENSIS**, *Hedysarum boreale*, **TANACETUM HURONENSE**, **PRENANTHES RACEMOSA** and **P. MAINENSIS**, *Gentiana Amarella*, var. *acuta*, **PEDICULARIS FURBISHIAE**, **SALIX GLAUCOPHYLLA** and **S. ADENOPHYLLA**, **GOODYERA MENZIESII**, *Juncus alpinus*, var. *insignis* and **J. TENUIS**, var. **WILLIAMSII**, *Triglochin palustre*, *Scirpus Clintonii*, **CAREX CRAWEI** and **C. BICOLOR**, *Equisetum palustre* and *E. variegatum*, and *Lycopodium sitchense*.

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